

## REMARKS

This amendment, which is timely with the automatic grant of the accompanying Petition for Extension of Time, is submitted in response to the non-final Office Action dated September 7, 2005, wherein claims 1 – 25 were rejected as being obvious in view of the prior art. By this amendment, applicant has amended claims 1 and 14, has added new claims 35 and 36, and has cancelled claims 26 – 34, which were previously withdrawn in response to a Restriction Requirement. The cancellation of claims 26 – 34 is made without prejudice to pursuing the subject matter of these claims in a divisional application. Claims 1 – 25, 35 and 36 are pending. Reconsideration and reexamination of the claims in view of the foregoing amendments and following remarks are respectfully requested.

### Objection to Machine Translation

All of the claims were rejected, in part, based on a “machine translation” of Japan Patent Publication 06-148,455 (“the ‘455 Japanese Application”). (The examiner refers to this application as “Koji”; however, Koji is the “first” or given name of the first-listed inventor. The first inventor’s surname is “Tsukamoto.”) Applicant objects to the use of an unverified, unauthenticated machine “translation.” No court of law would allow the use of an unauthenticated translation because such a translation is not reliable evidence of the contents of the original document. Computer or “machine” translation is notoriously inaccurate and cannot be trusted. Because computer translation technology is in its infancy there can be no assurance that the machine translation relied upon by the examiner accurately reflects what is disclosed in the ‘455 Japanese Application. The document itself acknowledges that: “This document has been translated by computer. So the translation may not reflect the original precisely.” In addition, in further acknowledgement of the unreliability of machine translation, the document contains a blanket disclaimer indicating that the “JPO and NCIPi are not responsible for any damages caused by the use of this translation.” This disclaimer reflects the fact that the machine translation cannot be trusted. In view of the lack of trustworthiness, applicant submits that it is improper to rely on a machine translation.

Applicant notes that the ‘455 Japanese Application is a priority document for U.S. Pat. No. 6,017,681, which is believed to reflect the contents of the ‘455 Japanese Application, among others.

### Claim Amendments and New Claims

Claim 14 has been amended to correct an obvious typographical error. New claim 35, which is dependent on claim 1, specifies that the optical components are mounted on first and second substrates, respectively. New claim 36, which is dependent on new claim 35, specifies that there are solder bumps between the two substrates. The subject matter of new claims 35 and 36 is shown, for example, in FIG. 2 of the application, as originally filed, and the accompanying text.

Independent claims 1 and 14 have been amended to more clearly differentiate them over the prior art of record. Specifically, each of these claims has been amended to state that the optical bridge waveguides have a diameter near the center which is smaller than the diameter at at least one end thereof. This is shown, for example, in FIGS. 3A and 3B. Specifically, FIG. 3A shows an embodiment wherein the optical bridge is narrower at the center than at both ends, and FIG. 3B shows an embodiment wherein the optical bridge is narrower at the center than at one end.

### Traversal of Rejection

Claims 1 – 25 were rejected under 35 U.S.C. § 103(a) as being “obvious” over the ‘455 Japanese Application (as reflected in the machine translation thereof), in view of U.S. Pat. No. 6,733,190 to Kuhara, et al. (“Kuhara”). According to the examiner, the ‘455 Japanese Application shows the use of polymer waveguides between optical components, but does not show waveguides having the claimed concave shape. The examiner relies on Kuhara as showing the concave waveguide shape, and asserts that it would have been obvious to combine the teachings of the two references.

The examiner contends that “it is obvious to one of ordinary skill that the shape [of the waveguides 91b in the ‘455 Japanese Application] is likely cylindrical due to surface tension of the liquid polymer material.” (Office Action, page 2.) Applicant respectfully disagrees. It is well known that surface tension tends to make a liquid assume a spherical, not a cylindrical, shape. Thus, the natural physical tendency would be for the liquid to bulge outwardly in a *convex* form.

Applicant respectfully disagrees with the assertion that it would have been obvious to combine the teachings of Kuhara with those of the ‘455 Japanese Application, even if the machine

translation is accurate. The two references deal with different problems and the examiner has failed to show any suggestion or other motivation for combining their teachings to use a concave shape. The examiner asserts, at pages 2 – 3 of the Office Action:

“It would have been obvious to one of ordinary skill in the art at the time the invention was made to compress the optical coupling section while it is cured/fused/hardened and form a concave cross-sectional shape. The motivation would be to suppress defects such as exfoliation, cracks, and bubble within the optical coupling section, as such defects substantially increase light propagation loss.”

Assuming for the sake of argument that this statement is correct, **compressing** the optical coupling section would **not** cause the optical bridge to have the claimed **concave** shape. Rather, compressing the liquid polymer would cause it to bulge and have a **convex** shape. In other words, compression would squeeze the polymer outward in a ball-like shape. The present invention is directed to a optical bridge shape where the polymer is thinner in the middle than at an end. This is achieved by pulling the optical components apart rather compressing them. Indeed, the technique used to obtain the claimed concave shape (pulling the substrates apart) is exactly opposite to what the examiner says would have been obvious (compressing them).

In addition, it is noted that compressing the liquid polymer alone would not be effective in removing cracks, bubbles, etc., since the polymer is not confined and can, therefore, freely move (bulge) outwardly. In order to avoid this problem, Kuhara discloses the use of “balloons” 40 which *confine* and compress the polymer. In *some* embodiments, an artifact of Kuhara’s balloons is the creation of an apparently asymmetrical concave shape (*i.e.*, the shape is concave only in one plane). Unlike the present invention, this shape has nothing to do with the optical properties of the optical bridge, *i.e.*, the shape is unrelated to light transmission. Thus, it is noted that even if Kuhara’s structure is considered to be an optical bridge, it is asymmetrical and is not uniformly thinner in the middle than at at least one end as required by the claims of the present application.

The examiner has not shown any suggestion in the ‘455 Japanese Application of a problem relating to cracks, bubbles, etc., associated with the polymers used in that application. It is believed that such problems are specific to the type of polymer and the manner of handling and curing. Assuming, for the sake of argument, that such a problem exists as to the polymers of the ‘455 Japanese Application, the only way taught by Kuhara to solve the problem is to compress the

polymer using “balloons”. However, it is submitted that it would not be possible to use Kuhara’s balloons with the structure of the FIG. 13 of the ‘455 Japanese Application because there is no room to position and manipulate the balloons. Thus, it is submitted that it is improper to combine the references.

Kuhara is concerned only with the limited problem of coupling an LED or a photodiode to an optical fiber, where both components are positioned horizontally on a substrate. This arrangement allow the use of balloons or other expedients to avoid the polymer problems discussed above. In fact, Kuhara is unconcerned about the shape of the polymer, as is evidenced by the fact that most of the depicted embodiments do not have a concave shape in any plane. The ‘455 Japanese application, in contrast, appears to be unrelated to optically coupling devices that are horizontally positioned on the same substrate. Thus, the balloons and other approaches described in Kuhara do not apply to it.

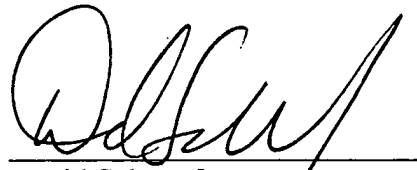
#### Conclusion

For the foregoing reasons it is respectfully submitted that all of the pending claims of the instant application are in condition for allowance, and such action is earnestly solicited. The examiner is invited to call the undersigned at the telephone number listed below if doing so might advance the prosecution of this application.

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Respectfully submitted,

  
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